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ABSTRACT

Recognizing that the hard part of making the application of technology successful is the development of appropriate management structures and approaches, this paper reviews the research and writings of several top management and communications professionals and correlates these theories to the information technology environment on campus. Six chapters focus on: (1) The Impact of Corporate Culture on the Management of Information Technology; (2) The Change Process and Information Technology; (3) The Evolving Information Technology Organization; (4) Maintaining an End-User Focus; (5) Attention to Detail; and (6) The Importance of Fun and Celebration. Experiences of the Maricopa (Arizona) Community Colleges are included in the discussion of each of these issues. It is noted that it is through the understanding of the human factors involved that information technology professionals can successfully implement new technology in institutions, and the final chapter presents "The 10 Commandments of Information Technology" together with a brief explanation of each one: (1) remember, this is a business; (2) talk to the user; (3) understand your "customer's" business; (4) use the vendor's knowledge; (5) training is not a discretionary cost; (6) develop information technology staff with a mix of business and technical skills; (7) management issues are always more important than technology issues; (8) make every contact with the user a public relations opportunity; (9) spend time on strategy; and (10) have a good time. A corporate sponsor profile (Digital Equipment Corporation) and a list of titles in this series are included. (60 references) (DB)

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People and Process:

Managing the Human Side of Information Technology Application

by Jan A. Baltzer

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About the Author

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INTRODUCTION

The Maricopa Community College District is the second largest community college system in the United States and is a recognized leader in the implementation of information technologies for both administrative and instructional purposes. As such, we have hundreds of visitors each year from educational institutions and businesses all over the world. These individuals usually come with the stated purpose of seeing how Maricopa is using technology, particularly networking technology.

I am constantly amazed that, after only a short period of time during which we discuss type and capacity of hardware and various hardware configurations, the majority of our visitors shift direction and begin to ask what I refer to as the "people and process" questions:

* How did you convince top management that you needed this system?
* How did you get faculty to buy into the network?
* How did you train your faculty and staff to use the new technology?
* How are you organized to manage the technology?
* Who makes decisions regarding new technologies and their applications?

The frequency and the depth of this type of questioning leads me to believe that more and more institutions are coming to realize that selecting technology is easy. The hard part is developing the management structures and approaches that make the application of the technology successful.

I recently heard a university chief information officer relate the story of how members of his staff had decided to interview users of one of their administrative computer systems to determine the user satisfaction level with the system. He was amazed to find that only a very small percentage of the users surveyed expressed satisfaction; in fact, over 65 percent of them were actually dissatisfied with the system. Upon further investigation, it was discovered that none of the reasons for user dissatisfaction had anything to do with the system itself or with the technology being used. The dissatisfaction really stemmed from the lack of training and awareness-building to acquaint users with the benefits of the new system.

If the technology selection is the easy part and the human factors are the difficult part, how, then, do we address these more difficult issues? Many of us have received and continue to participate in technical training. It is important that we be current in our respective fields. No less important to our success, however, is training in the way we deal with other human beings—the human element.

This paper focuses on the research and writings of many management and communication professionals on the topics of organizational culture, managing the change process, the evolving information technologies organization, maintaining an end-user focus, attention to detail, and the importance of having fun in the organization. Included are experiences of the Maricopa Community Colleges related to each of these issues. Only through understanding these human factors can we, as information technology professionals, succeed in implementing new technology in our institutions.

I
The Impact of Corporate Culture on the Management of Information Technology

"This culture stuff is great! I want one by Monday."[1]

– Anonymous CEO

The concept of corporate culture, while gaining popularity in the 1980s, is not a 1980s phenomenon. More than 2,000 years ago, this concept was articulated by Pericles in describing Athens' corporate culture. Pericles focused on the four characteristics he thought made the city unique:

1. the positive aspects of Athenian life—its openness, its democratic style, and its optimistic estimate of man's capabilities and potentials;
2. the importance of having a good time;
3. Athens' position as an opinion leader and innovator, as well as its tendency to set standards for others to follow; and
4. the balance achieved between the individual and the organization.[2]

What Pericles described were Athens' values and priorities, the way people related to one another, the standards by which performance was judged, and how things were done. This is exactly what we mean today when we discuss the "corporate culture" of our institutions.

Whether we use the term "corporate culture" or more aesthetic descriptors such as the organization's "ecosystem"[3] or "social architecture,"[4] the concept is the same and is based on answers to the following questions:

- *What is the organizational shape and structure?*
  What do the organization charts look like for this institution? Is there a strong hierarchical or pyramidal structure, or are people organized into more independent work groups or teams?
- *How are decisions made?*
  Does top management make all decisions or are individual managers and staff empowered to make decisions?
- *What is the relationship between management and individual employees?*
  How are employees evaluated? How do individuals participate in achieving the overall goals of the organization?
- *How is conflict resolved within the organization?*
  Is the conflict resolution process formal or informal? Is it handled by top or middle level management?

[1] James A. Belasco, *Teaching the Elephant to Dance: Empowering Change in Your Organization* (New York: Crown Publishers, 1990), p. 201.

[2] John K. Clemens and Douglas F. Mayer, *The Class Touch: Lessons in Leadership from Homer to Hemingway* (Homewood, Illinois: Dow Jones-Irwin, 1987), pp. 52-54.

[3] Jolie Solomon, "Management Secrets They'll Never Teach You at Business School," *Working Woman*, June 1990, pp. 53-54.

[4] Warren Bennis and Burt Nanus, *Leaders. The Strategies for Taking Charge* (New York: Harper & Row, Publishers, 1985), p. 111.

- *How does the organization address the issue of competition?*
  Is being on the competitive edge important? How is the competitive edge achieved?
- *What is the reaction to new ideas?*
  Are new ideas quickly acted upon or rejected? Are ideas studied by internal groups for potential implementation to the point of "analysis paralysis"?
- *What is the attitude toward risk-taking?*
  Is risk-taking encouraged or discouraged? Are there rewards or punishments for risk-taking?
- *How is success rewarded?*
  Are rewards high or low?
- *What is the cost of failure?*
  What is the likelihood of punishment and what type of punishment is meted out when mistakes are made within the organization? What are the consequences when "things don't work"?

In his research and analysis of how organizations answer the above questions, N. Dean Meyer categorizes organizations into four different cultural "types" based upon the above

Figure 1

CORPORATE CULTURES

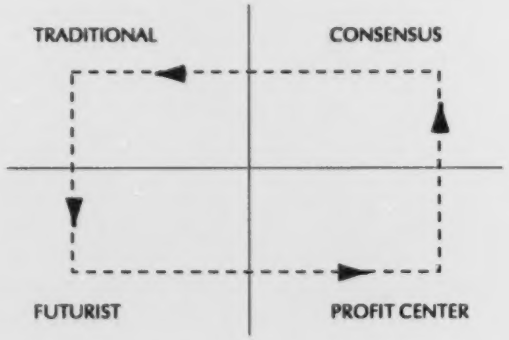
	FUTURIST	PROFIT CENTER	CONSENSUS	TRADITIONAL
Organizational Structure	**Flat, personality-based, fluid**	**Clusters of hierarchies; stand-alone and separate**	**Clusters of services; groups part of a larger organization with missions or goals**	**Hierarchical structure; pyramid**
Decision-making	Mid management recommends; top management decides	Decisions made at top of each profit center	Groups decide; "buy in" important	Top management decides
Staff Power	**Staff lean with little power; line doesn't pay any attention; no committees at all**	**Staff influences by selling their services**	**Staff use influence to get groups to accept ideas**	**Staff has real power; line obeys; line performance judged by ability to execute**
Conflict Resolution	Conflicts unresolved; believed to be healthy for the organization	Conflicts resolved one on one	Conflict resolved through groups, grievance committees	Conflicts resolved through appeals process
Competitive Edge	**Competes through research and development**	**Competes through niche products; not integrated**	**Competes by broad-scale evolution or integration of products or services**	**Competes by efficiency**
Reaction to New Ideas	New ideas met with range from enthusiasm to indifference	New ideas good if relate to unit goals; valueless if relate to another unit's goals	New ideas okay if there is consensus	New ideas are studied; lots of committees
Risk Taking	**Enjoy taking risks**	**Risks are okay if result in profit**	**Groups take some risks**	**Averse to risks: "don't rock the boat"**
Reward for Success	Successs reward low; hire the best, pay well, and expect success	Success reward high if enhances bottom line	Success reward moderate	Success reward low
Cost of Failure	**Failure cost low**	**Failure cost moderate**	**Failure cost high because group is involved; larger investment**	**Failure cost high**

Compiled from information derived from workshop by Van Vanek

issues: traditional culture, consensus culture, profit center culture, and futurist culture.[5] The grid in Figure 1 was compiled from information obtained during a workshop given by Van Vanek, information systems executive program manager for Digital Equipment Corporation.[6] This grid shows how these cultures compare and contrast.

Meyer's research also indicates that organizations move through the various types of culture on an X-Y axis as shown in Figure 2. He asserts that when most organizations begin, they start out in a futurist culture with a new idea, a new product, and competitive advantage. As more people are involved and more users get involved, the culture drifts toward the profit-center culture with more people having a vested interest in the success of the organization and more attention paid to the bottom line. Management change often occurs at this point in order to drive this push from the futurist to profit-center culture. With emphasis on the bottom line, the organization begins to spin off different versions of the product line and there is pressure for integrated services and products. Task forces are established with each segment of the organization involved and the move toward consensus culture begins. As integration occurs, this drift becomes stronger and nothing is done without consensus. This is deemed to be a positive move within the organization until the organization begins to lose its competitive edge because of how decisions are made. At this point, the organization establishes policies, procedures, and standards to make sure decisions can be made quickly and efficiently. This begins the move toward traditional culture. The traditional culture does not foster innovation and, to survive, the organization creates strategic business units that can operate separately from the regular group to function as entrepreneurs and the cultural cycle begins again. Organizations do not easily move diagonally across the axis.[7]

Figure 2



What is important about this research is that we have come to see that organizational culture is based on very specific kinds of behavior. By answering the questions on pages 2-3, we can begin to better understand how our institutions work, how individuals relate within the institutions, and what is valued within the institution. Secondly, this research indicates that organizational culture is not static; organizational culture shifts as the organization grows and as values within the organization change. Finally, we learn that organizational culture can be different within different parts of the organization. This is particularly true in very large institutions such as large universities, multi-college systems, or multi-campus institutions.

Corporate Culture and Information Technology

For an information technology professional, success or failure within an organization can be the direct result of the individual's ability to analyze his/her corporate culture and then develop strategies to work within that culture. Meyer has developed an information systems strategy tool called GamePlan which illustrates this concept. GamePlan is an expert system based on over ten years of research about various information technology organizations. The individual playing the game assumes the identity of a new manager whose major task is to introduce end-user computing into the organization. The new manager has a series of strategies or "cards" to "play" to achieve this goal, including: developing an information systems pilot, establishing a staff steering committee, writing a formal charter, implementing end-user computing within a given department, writing a briefing paper, establishing a user steering committee, conducting a management awareness program, establishing an information center, writing a strategic plan, and installing a backbone network.

Success in GamePlan depends upon the manager's ability to analyze which strategies will work within the particular corporate culture. For example, in a traditional culture where top management approval is required for all new activities, and where failure cost is high, success rewards are low, and new ideas are studied for extended periods of time, technology is implemented in a slow and steady manner. The manager in this culture is more successful if he/she begins

[5]N. Dean Meyer, *GamePlan* (Ridgefield Conn.: N. Dean Meyer & Associates, 1987), pp. 23-24.

[6]Workshop conducted by Van Vanek, Digital Equipment Corporation, Phoenix, Arizona, 27 April 1990.

[7]Ibid.

awareness programs and establishes steering committees early. Formal charters and strategic plans must be developed before technology can actually be implemented. Smaller steps are taken with technology implementation because results must be proven before a large amount of money will be spent.

In a consensus culture where new ideas are okay if there is group consensus and where decisions are made by the group once they have "bought into" the idea, the manager must also begin awareness programs and steering committees early, but formal charters are not required. Technology is implemented with a ground-swell in this culture. The biggest rewards here come from implementing the technology in the user's environment.

In a profit center culture, where decisions are made on a bottom-line basis, formal charters, policies, awareness programs, and user committees are not as important as demonstrating immediate value for the implementation of the technology. All technology implementation in this culture is focused and mission-oriented.

Finally, in a futurist culture, where individuals enjoy risk-taking and want to be the best at what they do, technology is implemented in a very dramatic and visible way. The successful manager in the futurist culture avoids formal charters, policies, strategic plans, awareness programs, and steering committees. These strategies take too much time. Instead, the focus is on implementing the technology in highly visible and strategic areas of the organization.[8]

Analysis of the Corporate Culture of the Maricopa Colleges

The Maricopa Community College District is a multi-college district composed of eight autonomous, separately accredited colleges, two educational centers, and a skill center. Each college has its own president, deans, faculty, and support staff. The District office functions as a support mechanism to the colleges, educational centers, and the skill center.

The multi-college structure of Maricopa and its size make it not unlike other large organizations which are composed of many different "groups" of individuals with totally different corporate cultures coexisting within the institution as a whole. There are segments of the Maricopa District that exhibit the characteristics of the traditional corporate culture. These segments are driven by top management and are averse to risk. These are the groups that go strictly "by the book." There are also segments of the Maricopa District that are profit-center oriented. Most notable among this culture are the outreach or noncredit programs, which must be self-supporting. The two predominant corporate cultures within Maricopa, however, are the futurist culture and the consensus culture.

At the top levels of the Maricopa District, the futurist culture dominates. Top management of the Maricopa District promote risk-taking. They believe in empowering managers to try out new ideas and programs; they believe that Maricopa can and should be seen as a national leader, particularly in the area of information technologies. The price of failure here is relatively low. The chancellor of the Maricopa Colleges, Paul E. Elsner, often speaks of the need to provide individuals with the opportunity for "interesting" failures.

One of the best examples of how this futurist culture deals with the implementation of information technologies can be seen in the Maricopa District's approach to the introduction of electronic mail. In 1983, when the District chose to replace its old computer technology with a new line of computers, an electronic mail software product was bundled with the purchase. At that time, it was viewed by those in the MIS department as a "by-product" of the purchase, certainly not the main focus of the purchasing or implementation strategy. Top management thought otherwise.

Immediately upon purchasing the computers and the electronic mail product, the Maricopa District also purchased home computers for the chancellor, the vice chancellors, the college presidents, and the members of the locally elected governing board. Computer terminals also began springing up in offices throughout the District. The word went out that "we are going to communicate by electronic mail rather than paper mail." Chancellor Elsner even led a "paperless office contest" to see which Maricopa employee could eliminate the most office paper through use of the new electronic technology. The year was 1983—several years ahead of other educational institutions in the implementation of campus-wide electronic mail.

This futurist or "top-down" implementation of a new technology worked because the technology of electronic mail, by its very nature, is open. Electronic mail is a technology that supports the futurist culture giving all staff the opportunity to speak directly with top management and with peers.

The knowledge and understanding that this type of futurist culture exists within top management of the District makes it "safer" for management and staff to suggest or recommend

[8]Meyer, p. 24.

new approaches and new technologies. In 1989, when the staff of Information Technologies Services recommended a demonstration project using a new type of digital video codec for transmission of full-motion video across the districtwide microwave network, the recommendation was made with the knowledge that if the technology did not work or if there were acceptance problems among faculty and staff, there would be few repercussions. It was a "safe" recommendation even though digital video was a relatively new technology and the staff were inexperienced in its use.

When the digital video pilot went well, however, and the decision was made to move into full implementation of this new technology, the second dominant corporate culture of the Maricopa District came into play: the consensus culture. The colleges of the District are separately accredited and have their own missions and goal statements. They are autonomous. They are, however, part of the larger institution, the Maricopa District. While they can move as single institutions, they must also move as part of the whole. Thus, many decisions are made by consensus rather than by top management of the District.

The response to the video demonstration project in the spring of 1989 was so positive that the Information Technologies Executive Council (ITEC), the policy-making group for information technologies within the District, recommended that Maricopa move immediately to equip as many colleges as possible with this new digital video technology. At that point, one of two approaches could have been used. Either ITEC or the vice chancellor for information technologies could have named the colleges to receive the equipment, or the colleges could have been asked to step forward and volunteer. The latter approach was taken because it is consistent with the consensus culture that governs Maricopa's day-to-day operations. A call for proposals was disseminated to all colleges and the four to receive equipment were selected from among seven proposals submitted. Criteria for selection included the individual college's ability to support the new technology through existing video equipment and staff as well as the ability of the college to identify and schedule courses to be taught via this new technology.

The Phase II Video Demonstration Project, as this endeavor was called, is a classic example of how consensus cultures work. The idea was to use the live two-way video and two-way audio technology to enable students at one college to participate in a course originating from another college, thus sharing instruction among colleges using the technology of the districtwide microwave network. To identify the courses to be taught and the faculty who would teach them, the deans of instruction from the four selected colleges were convened. They, in turn, convened the department chairs and other decision-makers at their individual colleges. No one from the District office could identify the courses or dictate what would be taught and, because the colleges are autonomous, no one college could mandate to any other.

Similarly, the technical staff from each college were convened to decide how the technology would function at each institution and among institutions. These individuals reported to local college management, not to anyone at the District office. Their agreement on the method of equipment installation and interconnection was achieved by consensus, not by dictation.

Summary

The successful implementation of electronic mail and the successful use of the digital video equipment were both based on an understanding of the corporate cultures that exist within the Maricopa District. The processes used in both cases were carefully designed to operate within the respective corporate cultures because culture, ultimately, dictates how individuals within the organization behave and how they believe things "should be done." As James Belasco has noted in his book *Teaching the Elephant to Dance: Empowering Change in Your Organization*:

> Empowering messages come from the performance system about what you really want, from the personnel system about what you're really willing to reward and from the culture system about what's "right." Of these three, people listen most to the messages from the cultural system. The law of the culture outweighs any other law. It is the strongest empowering message of all. [9]

[9] Belasco, p. 200.

II
The Change Process and Information Technology

"Constant as change has been in this century, vital as it is now, it is still hard to effect because the sociology of institutions (any group of two or more members) is fundamentally antichange." [10]

– Warren Bennis

When any new technology is introduced into an organization, its chance of success is dependent upon the ability of the individuals introducing the technology to manage the change process. No one likes change. In his professional paper entitled "Technology is Not the Answer," Robert Loeb points out that changing our ways produces real fear in the hearts of managers. He states:

> This is not the fear that machines will replace people that grew in the 40s and 50s in response to the introduction of mainframe computers .... Nor is it the fear that we personally will have to learn something new (like typing at a computer keyboard). The fear lies much deeper: new technologies offer options to change the very nature of fundraising, advocacy, service delivery, education and research and we don't have the slightest idea what these new ways of doing work are all about.[11]

The topic of change can be found in every management text and publication on the market today. Nearly all of the experts agree on certain assumptions about change, including:

1. Change is a process rather than an event. Change does not occur at any one point in time, but, rather, unfolds within an organization.
2. Change is made by individuals, not by the institution. Without change at the individual level, it is virtually impossible for institutional change to occur.
3. Change is a personal experience. Because institutional change is dependent upon individual change, the individuals within the organization need to know and understand why they are being asked to make changes and what these changes will mean to them personally.
4. For change to occur there must be a formal or informal change agent facilitating the adoption of the innovation.[12]

One change model that goes further in describing what must happen at the individual level when innovation or change is introduced into the organization is the Concerns-Based Adoption Model (CBAM) developed by Hall, Wallace, and Dosset in 1973. The CBAM is based on the added assumption that change entails developmental growth in terms of the individual's feelings about the innovation being introduced and skill in using the innovation. In the CBAM, development

[10]Warren Bennis, *Why Leaders Can't Lead: The Unconscious Conspiracy Continues* (San Francisco: Jossey-Bass Publishers, 1989), p. 147.

[11]Robert E. Loeb, *Technology is Not the Answer* (New York: Telecommunications Cooperative Network, 1989), p. 5.

[12]Gene E. Hall, "Using the Individual and the Innovation as the Frame of Reference for Research on Change" (Paper presented at the annual meeting of the Australia Association for Research in Education, Melbourne, November 1979), p. 3.

of feelings is described in terms of Stages of Concern, and development of skill in using the innovation is described through the concept of Levels of Use.

The concept of "concerns" about the innovation or change "relates to the feelings, perceptions, motivations and attitudinal dynamics of individuals as they first become aware of an innovation, approach use and gradually become increasingly confident in their use of the innovation."[13] The Stages of Concern identified within the CBAM are:

Awareness:	The individual has little concern about or involvement with the innovation.
Informational:	The individual has a basic awareness of the innovation and interest in learning more about it in very general, non-personal terms.
Personal:	The individual is uncertain about the demands of the innovation and his/her role with the innovation. The individual begins to consider the relationship of the innovation to the reward structure of the organization and how this relationship may impact him/her personally.
Management:	The individual's attention is focused on the processes and tasks of using the innovation and the best use of information and resources.
Consequence:	The individual's attention is focused on the impact of the innovation on students in his/her immediate sphere of influence. How relevant is the innovation for students and what needs to be changed within the instructional process to increase student outcomes?
Collaboration:	The individual's focus is on coordination and cooperation with others regarding use of the innovation.
Refocusing:	The individual's focus is on exploration of more universal benefits from the innovation, including the possibility of major changes to the innovation.[14]

For those of us who would like to introduce new technologies into the organization, the Stages of Concern indicate that individual faculty or staff cannot begin to think about how an innovation may be used to improve their daily activities or actually use the innovation for this purpose (Level of Consequence) until they have passed through the preceding four levels or stages of concern. We must give them the vocabulary to discuss the innovation, show them how it works for others, and give them a framework in which they can try the innovation in a nonthreatening environment.

Just as important as the Stages of Concern, which are based on the feelings and motivations of individuals, are the Levels of Use of an innovation, which focus on the behaviors of the individual to approaching and using an innovation. In the CBAM, Levels of Use are defined as follows:

Non-use:	The individual has little or no knowledge of the innovation and is doing nothing to become involved.
Orientation:	The individual has acquired or is acquiring information about the innovation and has done some exploratory work with it.
Preparation:	The individual is preparing for his/her first use of the innovation.
Mechanical Use:	The individual focuses most effort on short-term, day-to-day use of the innovation. The focus is on mastering the tasks required to use the innovation.
Routine Use:	The individual is using the innovation on a routine basis, making few if any changes to the innovation or how it is used.
Refinement:	The individual begins to vary the use of the innovation to achieve new outcomes.
Integration:	The individual begins to combine his/her own efforts with related activities of colleagues.
Renewal:	The individual begins to reevaluate use of the innovation and to seek major modifications or alternatives to the present innovation to achieve increased impact or efficiency.[15]

CBAM research indicates that 60 to 70 percent of the first-year users of an innovation will be at the mechanical level of use and that, even with relatively simple innovations, it takes a significant period of time to move a small portion of the

[13] Ibid., p. 4.

[14] Ibid., p. 6

[15] Ibid., p. 10.

users into higher levels.[16] Where complex or highly technical innovations may be concerned, the time frame could be extended even further.

For the educational institution wishing to implement new technologies, the concepts of the CBAM indicate that initial and ongoing top-down support for a new technology is necessary. However, the long-term successful use of the innovation requires bottom-up implementation.

CBAM and the Maricopa Colleges

The Maricopa Community Colleges recognized very early that the key to computerization and the successful use of computers in instruction was to create a computer-literate faculty. A special program to meet this need was initiated in 1983 based upon the Concerns-Based Adoption Model. The essential element of this program was the opportunity provided for each participating faculty member to take a computer home for a three-month period. During this time, the faculty member was required to attend an afternoon workshop one day a week on computer topics taught by other faculty and the training services staff. Workshop topics ranged from word processing and graphics packages to communications and authoring languages.

During the three months in which they participated in the Faculty Computer Literacy Project, individual faculty moved through the various Stages of Concern identified in the CBAM. They began by increasing their awareness of computing and the vocabulary of computing. They became involved in gaining information about different types of computer applications, and saw how these applications could be used to help them do their jobs differently and more efficiently. Finally, they began to see how the new computer tools could be adapted to enhance instruction in their own individual classes.

The faculty also moved through the various levels of use described in the CBAM. Most, if not all, faculty reached the routine use level, in which they began to use the computers on a regular basis as part of their daily activities. Several achieved the higher levels of use and began to use computers in truly innovative and creative ways.

A new group of faculty cycled through the project every three months. There was a great demand for entry to this program, but all faculty who wanted to become computer literate were accommodated. The project resulted in 80 percent of the full-time faculty becoming computer literate and an explosion of computer use within the Maricopa District.

Had Maricopa tried to place computers in faculty offices or install major computer labs on college campuses without this type of literacy effort, the hardware might have gone virtually unused. At Maricopa, we firmly believe that the successful infusion of computing into the instructional programs was due primarily to the initial efforts to acquaint faculty with computers as tools, to help them work through their concerns regarding this new technology, and to give them the skills to use and manage this innovation.

Other examples can be cited of how the Concerns-Based Adoption Model has successfully been used to introduce and expedite change within the Maricopa District. For example, in 1984, following the passage of a $75 million bond referendum, Maricopa launched a $150 million capital development program. This program included approximately $35 million for computing and telecommunications. At the beginning of this program, an effort was undertaken to determine the college priorities for telecommunications spending. An individual from the Maricopa District office was identified to survey the colleges to get the process started. The goal was to get individuals at the colleges to "dream big," to identify what they would like if they could have anything in the world to enhance their programs through the use of telecommunications.

After several months of discussion and hours of one-on-one and small group interviews, the answer was overwhelming: more overhead projectors were needed for classrooms. The individual who was assigned to develop the list of priorities from the college sessions was stunned and frustrated. The anticipated clamor for video conferencing, telecommuting, on-campus video distribution, satellite-based programming, computer conferencing, and so forth, simply had not surfaced. The problem clearly lay in the fact that the people interviewed talked about what they knew, and the majority of them knew only about traditional audio/visual equipment; they couldn't anticipate the newer technologies because they had no real personal knowledge of them.

What ensued was a "knowledge campaign" to raise the level of awareness among the faculty, staff, and administration at the colleges and at the District office. Workshops on "New Telecommunications Systems for the 80s" were conducted at each college and at the District office. These workshops included slide/tape presentations of what kinds of technologies were currently being used for instruction and/or corporate training outside of the Maricopa District. Articles about

[16] Ibid., p. 13.

the use of telecommunications technologies were circulated to faculty and staff. One-on-one and small group sessions were held with faculty and staff to present various technologies which could be used to enhance curriculum. This process took nearly one year, but culminated in completion of a districtwide needs assessment that addressed the ways in which telecommunications technologies could and should be used within Maricopa—the first phase of the Telecommunications Improvement Project through which the Maricopa Colleges were wired for voice, data, and video communications, and many of the new technologies were implemented.

It would have been easy for the information technologies staff at the District office and selected individuals from the colleges to skip this time-consuming process and simply compile the list of technologies required and the ways in which these technologies could be implemented. Without this "knowledge campaign," the technologies could still have been purchased and installed throughout the District. Without this campaign, however, it is doubtful that the technologies would have been used as rapidly or have achieved the penetration that they have achieved to date.

For true change to occur, for true adoption of the new technologies to happen, it was necessary for individuals throughout the District to increase their basic knowledge of these technologies and how they were being used elsewhere. It was important that they be given an opportunity to "play" with the technologies. It was important that they be a part of the technology selection and implementation process.

Summary

In *Agents of Change: Managing the Introduction of New Automated Tools*, Barbara Bouldin states that it is important to "remember the main issue is overcoming resistance, and that is equivalent to discovering the concerns and fears of your users and then enabling them to feel comfortable with the change process."[17] The Maricopa Community Colleges understand this issue and have successfully used the Concerns-Based Adoption Model to introduce new technologies into the institution.

[17] Barbara M. Bouldin, *Agents of Change: Managing the Introduction of Automated Tools* (Englewood Cliffs, N.J.: Yourdon Press, 1989), p. 125.

III
The Evolving Information Technology Organization

"Some managers may argue that organizational structure is unimportant where good people are motivated by a culture of teamwork that leads them to think beyond their job descriptions—a culture which is often dependent on a charismatic leader. Good people and good leadership do not substitute for good organizational design. Good organizational design does not bet on above average people and their altruism, but rather enhances the performance of good people."[18]

– N. Dean Meyer

For the past decade, technical and management journals have been filled with articles related to the evolving organizational structure for information technology organizations. The ongoing arguments regarding the pros and cons of separate or combined administrative and academic computing organizations have been joined with the arguments for and against combining telecommunications and computing into a single organizational structure. If combined, which receives top billing? If separate, how do the two relate?

In the argument of telecommunications vs. computing, it is important to remember that telecommunications, prior to the divestiture of AT&T in the early 1980s, meant telephones, and was considered by most institutions to be a utility—a necessary evil like electricity and water. It was, therefore, usually housed within a department of facilities management, administrative services or, in some institutions like the Maricopa Community Colleges, in the purchasing department. Decisions on what type of services the institution required were made by non-management staff with the guidance of sales representatives from the local phone company. Computer or MIS departments requiring telephone lines for connections to remote computers leased their own lines from the local operating companies without regard for, or consultation with, the telecommunications staff of the institution.

With divestiture came the realization that Ma Bell was no longer in charge. Institutions were required to make their own decisions regarding telephone services, including owning and operating their own telecommunications equipment and networks. At this point, professional telecommunications staff were often hired and elevated to a higher status within the organization. In some cases, institutions merged the less expensive and more mechanical service of telecommunications into the more expensive and more complicated service of computing. This marked the first stage of integration of the new information technology organizational structure: separate voice and data departments with separate staff

[18] N. Dean Meyer, *IS Structural Programming* (Ridgefield, Conn.: N. Dean Meyer and Associates, 1990), p. 2.

reporting to a single manager. This manager was usually the director of computing or manager of MIS.

In addition to a new recognition of the function of telecommunications within the organization, divestiture also brought new players to the marketplace. New companies were formed to produce telecommunications products and services; companies who had been involved with the telecommunications industries began to expand their offerings. Computer companies began to take advantage of these new technologies and services to enhance the connectivity or connectability of their products. New integrated products were produced which began to take advantage of both voice and data technologies. The lines of demarcation between telecommunications and computing began to blur and, in many organizations, duplication of effort was seen with both segments of the department contracting for services and purchasing equipment. Many information technology organizations have not progressed past this point organizationally.

Those institutions that have moved beyond this point have noticed that the emphasis has recently shifted away from mainframe computing and pure telecommunications to the idea of the network, and that the role of the network manager is emerging. This further integration of voice and data communications is being enhanced as new imaging and video technologies emerge. So strong is the movement toward identification of the network as the primary organizational integration point that George Colony, president of Forester Research, Inc. (a high tech marketing firm in Cambridge, Massachusetts), asserts that "by the middle of this decade, [network managers] will be the primary leaders of technology in Fortune 1000 companies."[19]

The integration of multiple technologies within the information technology organizational structure leads to the emergence of new staff roles and makes cross-training in several technical disciplines mandatory. Gone are the voice-only technicians. Gone are the computer operations staff who have no experience or association with data communications and networking. In this new organizational environment it is important that individual staff understand and appreciate voice, data, video, and network communications. As one management consultant has observed, the successful information technology professional of the future will have a job description that reads like St. Paul's, requiring the ability to perform miracles, the ability to speak seventeen languages simultaneously, and good writing skills.

[19]Arielle Emmett, "Climbing the Corporate Telecom Ladder," *Network World*, 20 August 1990, p. 38.

Just as it is important that individuals within the information technology organization be cross-trained and have a working knowledge of all technologies in use, it is also important that top management within the information technology organization have no more allegiance to one technology than to another. To be truly successful, the once-independent technologies must be seen as a unified set of strategic tools to help the institution achieve its overall goals.

The Evolving Information Technology Organization at Maricopa

In 1984, management of administrative computing was housed within the Management Systems and Computer Services (MSCS) department at the Maricopa District office, telephones were the responsibility of a purchasing clerk in the business department, and educational telecommunications was the purview of Rio Salado Community College, the non-campus college within the District which had as one of its primary missions the use of technology to deliver education to distant learners. Management of computing at the college level was decentralized to the colleges. The Executive Computer Council, which had been formed in 1980 to establish policy and make purchasing decisions regarding computing within Maricopa, had no authority over telecommunications. Then divestiture of the AT&T Corporation occurred and Maricopa, like so many other educational institutions across the United States, found itself in a very different communications environment.

In April 1984, the District office established a half-time position of director of telecommunications to "investigate the district's alternatives regarding telecommunications." In October 1984, the Executive Computer Council took the first steps towards what is now an integrated information technologies department at the District office by accepting a planning document based on the following assumptions and observations:

1. The Maricopa Community Colleges were beginning to seriously address the impact of divestiture of AT&T and deregulation of the telecommunications industry as a whole. This necessitated an integrated approach to voice and data requirements.
2. Cabling requirements for voice and data needs were perceived to be very much the same as those of the network and switching equipment for both types of communications.
3. The District had been successful in building several groups of specialized personnel (i.e., repair services, training services, etc.) in support of computing and data communications.

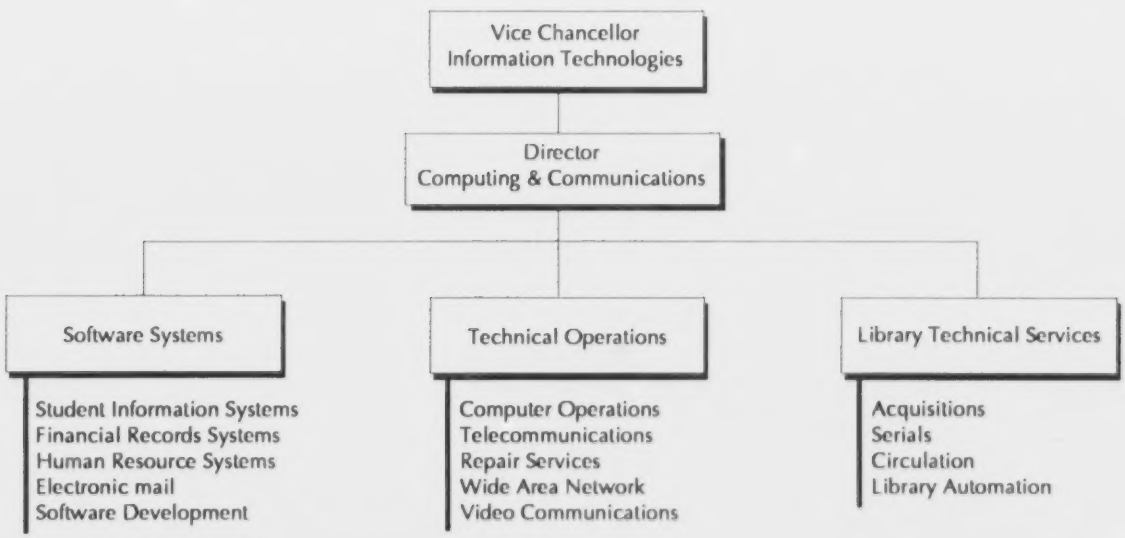
4. According to a July 1984 study conducted by International Data Corporation and reported in *Computerworld*, 82 percent of the Fortune 500 companies interviewed who had defined telecommunications functions had housed those functions within their management information systems areas.
5. The integration of telecommunications and computing into one department could streamline support for both telecommunications and data communications.
6. The computer organizational model that existed at that time was one of centralized/decentralized, instructional/administrative emphasis, and was felt to be a prototype for the implementation and management of telecommunications within the District.
7. The skills existed and could be expanded in Management Systems and Computer Services to support the telecommunications effort. Housing telecommunications separately from MSCS could result in duplicate support groups of employees.
8. Libraries districtwide were preparing for automation and integration of services. This integration might best be implemented by District management support of both computers and telecommunications.
9. The District capital outlay program provided for approximately $35 million in computing and telecommunications. The planning for the expenditure of these funds could best be accomplished through an integrated computer and telecommunications department.
10. The colleges required a mechanism for feeding information and questions regarding telecommunications-related issues into the Executive Computer Council for action, similar to the process which existed for computer-related issues.
11. Two of the colleges within the District had already expanded the focus of their local computer interest groups to include telecommunications as well as computing.

The notable thing about these assumptions is not their profundity. It is the fact that they were made and acted upon in 1984, several years before most institutions moved toward an integrated management of voice and data communications.

As a result of its actions in October 1984, the Executive Computer Council reconstituted itself as the Information Technologies Executive Council (ITEC). This group exists today as the policy-making body for all information technologies—voice, data, video, and image—within the Maricopa Community College District. The membership of ITEC is composed of the four vice chancellors of the District, a member of the governing board, a representative from the college presidents, a representative from the faculty, and two ex-officio members—representatives from Arizona State

Figure 3

FUNCTIONAL ORGANIZATION CHART



University and the Phoenix Union High School District. This group approves all equipment acquisitions in the District, thus assuring that established standards are maintained.

A secondary result of the actions taken by the executive council in October 1984 was to change the name of the MSCS department to Information Technologies Services and to make the director of telecommunications a permanent management position within this department. The director of telecommunications was given responsibility for coordination of all telecommunications (telephone-related) systems within the District. The charge was to "do something about these phone systems"! Thus began a three-year Telecommunications Improvement Project that resulted in the recabling of all colleges for voice, data, and video communications; the installation of new telephone systems with voice mail and call-accounting capability at each college; and the installation of a districtwide digital microwave network to connect the voice, data, and video networks between and among colleges.

With the completion of the Telecommunications Improvement Project, particularly the integration of voice and data communications across the same cable plant at the college level and the integration of voice and data communications across the districtwide digital microwave network, it became apparent that further integration of functions was required. At this point, Information Technologies Services merged the functions of telecommunications, repair services, and computer operations—all of the hardware-related elements of the department—into one unit with one director. The assignment to this director was to integrate the functions required to support voice and data communications.

In 1989, the position of Director of Information Technologies Services was changed to Vice Chancellor for Information Technologies Services in recognition of the strategic importance of information technologies to the overall goals of the Maricopa District. At this time the Vice Chancellor declared the need for further integration of the functions within Information Technologies Services and, in the summer of 1990, all functions within Information Technologies Services—including voice, data, and video communications as well as software development and automated library systems—were merged under the position of the Director of Computing and Communications. See Figure 3 for a functional organization chart.

At the same time that this integration was occurring in the District office, similar integration of functions has occurred at several of the colleges within the Maricopa District. More and more, the structure of one information technologies department that is responsible for voice, data, and video communications is becoming the preferred organizational structure within Maricopa.

Summary

What Maricopa has been able to create within Information Technologies Services is a lean and flexible organization that is alert to the possibilities of using all types of information technologies. Through this new, integrated organizational structure, we have been able to reconceptualize the way we work and redesign the processes we must use to move ahead.

IV
Maintaining an End-user Focus

"The right customer support concentrates on the customer, not the corporate policy book or quarterly bottom line .... Nordstrom has fans, not customers, because it provides the right support."[20]

– Guy Kawasaki

In *The Art of War*, Sun Tzu makes the following observations:

> Know the enemy and know yourself; in a hundred battles you will never be in peril.
>
> When you are ignorant of the enemy but know yourself, your chances of winning or losing are equal.
>
> If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril.[21]

Although I would never consider the end users of information technology systems to be "the enemy," I do believe that Sun Tzu's words have wisdom for information technology professionals. In fact, I have developed an information technology corollary to Sun Tzu which is as follows:

> Know the user and know yourself and, together, you will always succeed.
>
> When you don't know the user and/or understand his/her needs, but do know what you are doing, your chance of succeeding is fifty-fifty.
>
> If you don't know the user's needs and aren't sure what you are doing either, your chance of succeeding is very small.

If we assume that, as information technology professionals, we understand who we are and what we need to do technically to implement and support technology in our institutions, then the challenge is to learn about our users and to maintain our focus on their needs. This can be accomplished in six very easy and logical steps: look at the organization in a new way; develop user groups; document what you can do for the end user; communicate well and continuously, taking special care to avoid and correct misconceptions; look beyond the technical solution to a problem; and train, retrain, and train some more.

✱ Look at the organization in a new way

James Belasco suggests that looking at the organization in a new way involves the understanding that the organization is really an "interdependent system of groups, departments, and individuals." Everyone in the organization has a customer and everyone also has suppliers. "The web of customer-supplier contracts binds all the components together to produce an organization."[22]

If we abstract this customer-supplier concept to educational institutions we can see that we, as information technology professionals, are suppliers of technology and information to the rest of the institution—our end users. They are our "customers." We, in turn, must rely on them to supply us with the very data needed to make up our institutional databases, for the data entry functions performed by countless staff

[20]Guy Kawasaki, *The Macintosh Way* (Glenview, Ill.: Scott, Foresman and Company, 1990), p. 11.

[21]Sun Tzu, *The Art of War*, translated with Introduction by Samuel B. Griffith (London: Oxford University Press, 1963), p. 84.

[22]Belasco, p. 228.

throughout the institution, and for administrative support for our fiscal and human resource functions. In short, we need our customers as much as or more than they need us. They are the reasons we are here. By keeping this in mind we can gain a new and more realistic perspective on the importance of providing top quality services to our end users.

* **Develop user groups**

The benefits to be gained from the formation, operation, and continuance of user groups are readily identifiable. User groups are an effective means of obtaining information about the status of current projects and needs for the future. User groups offer a vehicle for us to communicate with a much larger audience, using the members of these groups to disseminate information to the larger population. User groups can provide the users themselves with an opportunity for information exchange so that the proverbial wheel is not reinvented throughout the organization. User groups can also present a strong, united, and collective voice to top management when new initiatives need to be undertaken or new technologies need to be explored.

* **Document what you can do for the end user**

Dan Trauscht, manager of telecommunications for the 3M Corporation has said:

> How do you get outside of your own world and into the customer's? First, you have to document what you can do for them, and then you have to go out to the divisions and show them. [This process] forces you to think about why customers might want the service and how it will benefit them.[23]

Many organizations are beginning to develop documents called "Service Level Agreements" to share with end users the types of services the users can expect from the information technology department. These agreements focus on services provided to the user community, but also serve as communication devices within the information technology organization to communicate levels of expectation and performance. It is very important that IT professionals know their product, the services and functions they can provide, and be able to communicate about these products to the end user.

* **Communicate well and continuously—avoid and correct misconceptions**

A fourth step to maintaining user focus is for the information technology organization to make a positive effort to correct or avoid user misconceptions of the IT organization and/or the technologies being used. An *MIS Week* article by Rebecca Dymond states:

> In a perfect world, technical managers would understand the market forces that drive their company and would work more efficiently with their business counterparts. Business managers would envision how information technology can be a key element in the overall corporate strategy.[24]

This is obviously not a perfect world and misconceptions do exist about the use of technology within the organization and the types of services that can be provided by the information technology organization. The rumor mill can run amuck with misinformation about dollars spent on technology, the ways decisions are or are not made, and how the technology will be distributed throughout the organization.

Dymond's article goes on to suggest that misconceptions can be corrected or overcome through self-promotion, through the use of information technology sponsors in other departments, or through the decentralization of information technology personnel to end-user departments. Self-promotion includes the use of such vehicles as department newsletters and user groups to share pertinent information about the use of information technologies and how the use of such technologies can help individual employees and departments achieve their stated goals. Sponsors in other departments can help information technology professionals communicate more effectively with end users and can help the information technology professionals garner the trust of the institution's top management. Finally, information technology personnel can be decentralized to work directly with end-user departments. This may be considered a radical step, and requires caution to maintain a central planning base, but it can foster a more trusting relationship between the end users and the information technology organization.

* **Look beyond the technical solution to a problem**

It has been suggested that unless a user complains about a specific technical problem, the chances are that the problem probably has more to do with staffing levels and policies or procedures in the user's own department than with malfunctioning or poorly-designed voice or data systems. If we know this going into a discussion with an end user, we can take steps to help the user identify the true problem so that resolution can be sought in the appropriate quarters.

[23]"3M Net Exec Gets Down to Business," *Network World*, 4 June 1990, p. 25.

[24]Rebecca Dymond, "MIS Moves to Overcome User Misconceptions," *MIS Week*, 23 April 1990, p. 25.

We need to train our information technology staff to recognize when a hardware or software problem really exists and when it does not. This means helping them to develop the ability to analyze a unit's work flow and to understand how information technologies can impact that flow. We also need to train staff to interview people, listening to their concerns and arranging information in a coherent pattern. Staff need to master the art of diplomacy, steering users to discover the true source of their own problems. Staff also need to learn how to offer suggestions on the ways in which user policies or procedures might be improved to work in concert with information technology systems.

It is no longer enough to simply stamp a user complaint "no trouble found" and walk away. Even though the hardware or software may be working perfectly, as far as users are concerned, the technology is still "broken" if they cannot perform tasks or obtain needed information.[25]

* **Train, retrain, and train some more!**

Louis Bransford, executive director of the Public Service Satellite Consortium, has said: "Training not only prepares people; it changes attitudes. There is a direct correlation between training and positive attitudes toward technology."[26] No truer words have been spoken. Training is the cornerstone that makes it possible for us to successfully implement information technologies within our organizations.

Training must, however, be more than handing out information to employees about the new technology. It must be pertinent to the employee's job and the employee must be motivated to learn. A study conducted with 212 employees of major corporations in the Rochester, New York, area indicated that satisfaction with training and increased productivity were directly related to the following:

- the supervisor's realistic expectations of performance following training;
- other coworkers using the same software or hardware;
- individuals having a good idea prior to training how they would apply the training after attending the class;
- individuals having some experience with the hardware or software prior to the training;
- individuals having more than one reason to use the hardware or software;
- individuals having time to practice after the training;
- individuals being assigned specific tasks using the hardware or software immediately following the training; and
- the degree to which the individual's primary job was to use the hardware or software in question.

The conclusion of this study was that the success of training was directly related to the degree of the trainee's job-specific involvement with the subject.[27]

End-user Focus at Maricopa

Within a large multi-college system such as Maricopa, a process approach to management which ensures the involvement of many people from each of the colleges in shaping the information environment is essential. This has caused us to look at the organization in a new way, as Belasco has suggested, and to form a number of function-based user groups to provide advice and recommendations to the management of information technologies. These user groups help determine priorities and communicate back to the colleges the directions being taken. Currently, there are active user groups for student information systems, human resource systems, accounting systems, financial aid systems, academic systems, telecommunications, library automation, computer operations, and student tracking systems. These groups meet regularly and with some formality and organization.

One of the most interesting user groups within Maricopa is a districtwide faculty/staff planning group known as Ocotillo (oh'-ko-tee'-yo)—named after the plant whose branches sprout in many directions, but spring from one common base. The primary focus of the Ocotillo group is to create new ideas and to bring about discussion on topics affecting instruction by technology. It is a "think tank" of faculty and staff coming together for a common purpose—supporting teaching and learning. Each spring, several Ocotillo subgroups discuss issues and present research papers to the entire group at the Ocotillo retreat. Some of the ideas are only discussion; other ideas lead to action and to new programs. The Ocotillo structure has unleashed the creative ideas of many faculty. Approximately 200 faculty participate each year in Ocotillo.

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[25]Eric Schmall, "User Telecom Woes Not Always Technology-Based," *Network World*, 3 September 1990, pp. 21, 24.

[26]Louis A. Bransford, "Communications Technology and the Public Sector: Understanding the Process of Adoption," *Telematics and Informatics* 5:4 (1989), p. 433.

[27]Terry Boothman and Harvey Feldstein, "The Principle of Engagement," *Information Center*, April 1990, p. 13.

To try to deal with any misconceptions that may arise regarding information technologies within Maricopa, the Information Technologies Services (ITS) department publishes a quarterly newsletter called *Computing and Communications*. This newsletter carries articles about recent activities within ITS and stories about how faculty and staff at individual colleges are using information technologies to enhance the teaching and learning process. We have also acquired and nurtured advocates in other departments and at the colleges who help us "tell the story" and who give us feedback when systems are not functioning as they should.

As we have organized and involved users in the planning and implementation of information technologies, our need for training has exploded. One of the most interesting facets of Maricopa's technology transformation is, indeed, the tremendous amount of time and money spent on training. Board members, presidents, secretaries, faculty, and staff have "gone back to school" to develop a wide range of literacies. In many ways, Maricopa has probably done much more training than any other educational institution in the country. Moreover, Maricopa has done much more than many of the industries in the Phoenix metropolitan area.

The type of training needed to support technologies has not remained the same throughout the past few years. Maricopa began by offering a training program that provided consulting and systems support for faculty who were heavily involved in computing and data processing courses. This was a very intensive program, but served a relatively few number of faculty. Next came the Faculty Computer Literacy Project (FCLP) in which an effort was made to make the entire faculty computer literate. At this point, training needs shifted to running workshops and seminars covering the various topics of computer literacy. When all faculty had had an opportunity to participate in the FCLP, training efforts shifted to teaching the computer as a tool. Topics such as desktop publishing, spreadsheets, and databases were heavily emphasized in this aspect of the overall training agenda. The latest generation of training now concentrates on teaching people how to access information from various sources, including our student information systems, our library systems, and external sources.

Training concerns are not limited to the end-user environment. If we are to truly maintain a focus on end users, the technical staff of Information Technologies Services must receive training on how to approach and deal with nontechnical users. Over the past two years, ITS has provided training in the areas of communication skills and customer services for all technical staff.

Maricopa's training philosophy contends that it is just as important to train a clerical person as it is to train a faculty member or the president of a college on the uses of technology. Underlying this concern is the concept that users of technology must be sophisticated about their technology options. This approach has had tremendous payoffs at the department level, at the college level, and at the faculty user level. By having a variety of people participate in the many transformations that were taking place involving office automation, electronic mail, and other related technologies—including selection and installation of new telephone systems—Maricopa has been able to give employees a sense of ownership of technology.

Summary

People use applications, not hardware or networks. People want to know how new technologies will help them do their jobs more easily, faster, or more efficiently. Maintaining a clear focus on the end user and providing the user with appropriate and consistent support are the keys to success. This means involvement of users in the planning and implementation of technologies; it means keeping users up to date on the issues facing the IT organization; it means educating the users to help in the decision-making process; it means training users to use the technologies; and it means keeping IT staff focused on the real reason IT exists within the organization.

V
Attention to Detail

"[Doing things right] means paying attention to the details of running a business and building success brick by brick."[28]

– Guy Kawasaki

Not many authors of management or leadership texts write about the importance of paying attention to detail. You will not find this as a major heading in books by Bennis, Peters, or Naisbitt. Yet attention to detail can make the difference between a mediocre implementation of a new technology system and a great implementation.

When an institution or a department within an institution makes the decision to implement a new technology or a new technology application, the major issues that need to be resolved are evident:

What type of hardware will we use?
What type of software?
How much will it cost?
Where will we get the funding?
Who will do the work?

What often go unattended, however, are the small details that ultimately will determine the success of the new technology application.

There is nothing glamorous about the minute details of project management. As one Maricopa staff member has written on the white board in his office: "Spectacular success is preceded by dull preparation." The sad fact is that if you identify all of the details completely and accurately and then take steps to make certain that they are appropriately dealt with, most people in the organization will be unaware that you have done anything. If you do not plan to the detail level, however, they will know all too well that you have not planned thoroughly.

Telecommunications Improvement Project

One of the most comprehensive projects attempted by the Maricopa Community Colleges within the past four or five years has been the Telecommunications Improvement Project. This project had as its goal the complete replacement of all telephone services throughout the District and the establishment of on-campus and intercollege voice, data, and video networks. All telephone systems at each site were to be replaced with new, state-of-the-art digital telephone systems. Each site was to be completely rewired with twisted-pair wire and coaxial cable. A districtwide digital microwave system was to be installed for intercollege voice, data, and video communications. The total cost of the completed project was $6.2 million.

Obviously, the first questions addressed by the project team related to the communication needs of the colleges and the technology available to meet these needs. A thorough needs assessment was conducted and a detailed request for proposals was written. After proposals were received and evaluated, the technology was selected, and "all" that remained was installing the systems.

[28]Kawasaki, p. 11.

Conducting the needs assessment, preparing the bid specifications, and evaluating the vendor proposals were not easy tasks. They required hard work and many long hours. The much harder part of the project, however, proved to be identifying all of the details which needed to be addressed to make certain that individual faculty and staff were satisfied with the systems we purchased. The process we used was as follows.

First, we obtained floor plans of every building at every college; then we walked the buildings with college representatives to be certain that the floor plans were accurate. At first we were told that walking through the individual buildings was a waste of time. We had District draftsmen whose job it is to keep these drawings up to date. We had not finished the walkthroughs at the first college before this statement was proven untrue. Unknown to the District draftsmen, the college had removed walls and erected new ones and neglected to advise the draftsmen because these changes were deemed to be "minor." The additional walkthrough made it possible for us to prepare and disseminate correct floor plans—a crucial element in the recabling process.

Once we had accurate floor plans, we convened a group of individuals at each college and conducted a one-day training session to acquaint them with the new telephone systems and the data collection process. These individuals, referred to as our unit coordinators, represented the various departments and work groups within the institution. We chose to work with these individuals as our data collectors rather than collecting the initial data ourselves because we believed that the intimate knowledge these individuals had about the day-to-day workings of their departments would prove invaluable in the data collection phase. We were right. These individuals knew much more about how things really worked within their departments than did the college leadership. We trained the unit coordinators first on the features of the new telephone systems, even though it would be months before they had the new telephones on their desks, because we believed they needed to know how the new phones would work before they could tell us how their departments could use them. Next, we trained them on the way to collect the necessary data.

Following training, the first task of the unit coordinators was to take the floor plans for their individual areas and mark both the current and the desired locations for voice, data, and video outlets. When this task was completed, we walked the buildings with the unit coordinators to verify the jack placement and to clarify any questions that might have occurred during this activity. Participating in these walkthroughs were the individual unit coordinators, a representative from the college administration, a representative from the District telecommunications department, the vendor project manager, the vendor customer services representative who would ultimately prepare the database for the phone system, and the foreman of the cabling crew who would do the actual cabling. The thoroughness involved in this stage of the project resulted in: (1) a clear understanding of the work expected, (2) very few, if any, mislocated or missing outlets, and (3) a firm foundation for the succeeding phases of the project.

After the jack placement was completed and the agreed-upon floor plans were signed by a college administrator, the District telecommunications director, and a vendor representative, the second phase of data collection began. The unit coordinators were given a spreadsheet with the names of each individual for whom they were responsible. These spreadsheets had space for the unit coordinators to fill in the position title, room location, and current telephone extension of each individual as well as spaces to identify all the voice and data options that each individual would require.

When this portion of the data collection process was completed, the college administrator and the District telecommunications director reviewed the spreadsheets with the unit coordinator for accuracy and appropriateness of feature and hardware selection. Then individual forms were completed on every new telephone instrument to be installed. When the data collection forms were completed, they were compared, again, with the unit spreadsheets and the approved floor plans to make certain that all were in agreement. These same unit spreadsheets and floor plans were used by the technicians to place telephone instruments in individual offices at the time of cutover of the new system.

Whenever I describe this portion of the project to someone from outside the Maricopa District, one question always comes up: "Wasn't there a lot of staff time and paperwork involved in this process?" The answer, of course, is "Yes." It took weeks to complete the process at each of the colleges, but it was worth it. Having all of the information required in the same database made the actual installation process move more quickly and efficiently. Because we had college staff do the data collection and because we verified and cross checked it at each step of the way, there were very few, if any, conflicts as the systems went in. Those conflicts that did arise were handled by the college staff because they had ownership of the data.

Every system cutover took place on time, before the scheduled date. There were virtually no "customer" complaints. In most cases, faculty and staff went home one night leaving the

old telephone on their desk and walked in the next morning to find the new telephone on their desk functioning as promised. In addition to making certain that the right phones were placed in the right locations, the telecommunications project staff also made certain that a new telephone directory was delivered with each new telephone and that each individual received a confidential letter with his/her long distance authorization code and directions for using the code.

Detailed planning made the difference. The willingness of project staff to focus on the smallest segments of the project to make certain that the overall project went well made it possible for us to complete the Telecommunications Improvement Project on time and without a single major problem.

Summary

One of the Maricopa vice chancellors who had come to the District immediately preceding the beginning of the Telecommunications Improvement Project has been quoted as saying that he has experienced several telephone system installations, but has never seen any to compare with the smoothness of Maricopa's. Obviously, the "technical success" of the project was due to the selection of high quality equipment and a qualified vendor to install the network. Equally as obvious is that the "functional success" of the project—what individual faculty and staff saw and did—occurred because we paid attention to details and, to paraphrase Guy Kawasaki, "built the system by doing things right."

VI
The Importance of Fun and Celebration

"We've often commented that we have a secret hypothesis (it's one that we don't wish to test, since there's a good chance we're wrong). The hypothesis is that over the entrance to the Harvard Business School (or the business/professional school of your choice), there's a giant stone lintel. Deeply inscribed in the granite are the following lines: 'All ye who enter here shall never smile again. American business/education/etc. is damned serious stuff!' And yet time and again . . . . we've observed that winners are people who have fun— and produce results as a result of their zest."[29]

– Tom Peters and Nancy Austin

In the summer of 1990, Dr. Paul Elsner, chancellor of the Maricopa Community Colleges, delivered the keynote address for the Leadership 2000 conference sponsored by the League for Innovation in the Community Colleges. Over 2,500 attendees listened as Dr. Elsner discussed his assumptions regarding the state of information technology and its impact upon leadership. In his address, Dr. Elsner stated: "The successful leader has the ability to lighten the load of his/her staff through the use of humor and by providing activities which give staff a type of release."

This idea is echoed in the works of many prominent management authors including Tom Peters and Nancy Austin in *A Passion for Excellence*, James Belasco in *Teaching the Elephant to Dance: Empowering Change in Your Organization*, Robert Levering in *A Great Place to Work. What Makes Some Employers So Good (and Most So Bad)*, and Terrence Deal and Allan Kennedy in *Corporate Cultures: The Rites and Rituals of Corporate Life*. The latter text, however, best describes the concepts of play, ritual, and ceremony which are the ways in which organizations have fun and celebrate.

Deal and Kennedy describe the concept of "play" as the creative side of corporate life through which corporate management encourages innovation and gives employees an opportunity to release tension. They go on to say that "despite the fact that it has no real purpose and no rules, play in its various forms . . . bonds people together, reduces conflict and creates new visions and cultural values."[30] Hewlett-Packard's company-owned recreation areas for employees are examples of their commitment to "play." HP employees can enjoy mountain resorts in both California and Pennsylvania.[31] Tandem Corporation is renowned for its Friday afternoon "beer-busts" which everyone attends. Tandem also owns a golf course, exercise room, and swimming pool that are available for employee use.[32] Johnson Wax gives employees an opportunity for "play" at its 147-acre park that includes a huge indoor recreation center and a

[29]Tom Peters and Nancy Austin, A *Passion for Excellence* (New York: Random House, 1985), p. 252.

[30]Terrence E. Deal and Allan A. Kennedy, *Corporate Cultures. The Rites and Rituals of Corporate Life* (Reading, Mass: Addison-Wesley Publishing Company, Inc., 1982), p. 62.

[31]Ibid., p. 3.

[32]Ibid., p. 11.

separate aquatic center.[33] Octel, a leader in voice processing technology, gives employees free popcorn every afternoon to encourage people to get together informally.

The concept of "ritual" is described by Deal and Kennedy as the "rules [that] guide behavior in corporate life and are, in effect, dramatizations of the company's basic cultural values. Behind each ritual is a myth that symbolizes a belief central to the culture."[34] Examples of "rituals" in corporate America abound. Sam Walton, one of the richest men in America and president of Wal-Mart, shows up with coffee and doughnuts at 2:00 a.m. on the day preceding an opening to recognize those people who are working extra hard to make the opening a success.[35] Every time a new Publix supermarket opens in Florida, top management officials welcome new employees at an opening night banquet, and the officers stay the next morning to work shoulder-to-shoulder with the newcomers stocking the shelves and bagging groceries.[36] At Marion Laboratories in Kansas City, Missouri, over 2,000 employees manufacture and sell prescription drugs. At Marion, employees refer to the company as "uncommon" and to those who work there as "uncommon people." The term uncommon is also applied to certain rituals. For instance, during the summer months, employees are permitted to take Friday afternoons off with pay. Those days are called "uncommon Fridays." If production meets certain specified goals, employees are given an additional week of paid vacation between Christmas and New Year's Day. When this occurs, it is called "uncommon winter."[37]

Finally, "ceremony" is described by Deal and Kennedy as the "cultural extravaganzas or simple events when employees pass particular milestones."[38] Everyone is familiar with the "years of service" ceremony where long-time employees are rewarded for their commitment to the organization, but many organizations are finding new and more innovative ways to celebrate milestones or excellence in service. For example, the Paul Revere Companies (insurance providers) have established a PEET Program. PEET is an acronym for "Program for Ensuring that Everybody's Thanked." Each Monday morning, each of the seven members of the executive committee gets his PEET sheet. The sheet lists three quality team leaders along with some highlights of what their team has accomplished lately. The executive committee has made the commitment to find at least five minutes to visit each of their assignments sometime during the week and thank them for their good work.[39] Similarly, Tektronix has a "You Done Good Award." This corporate "ceremony" is carried out by letting any employee send a "You Done Good" certificate to any other employee.[40] In 1984, Samuel C. Johnson, CEO of the S.C. Johnson Wax Company, celebrated the 70th anniversary of the British subsidiary by closing the British plant for a week, chartering a Boeing 747 and flying the entire British workforce, 480 people, to the United States. During their stay in the U.S., the British employees of Johnson Wax toured the company's facilities and were feted at a banquet. They spent two days sightseeing in New York City and had dinner at the World Trade Center.[41]

Fun and Celebration at Maricopa

Having fun is an underlying theme of everything that is done in the Information Technologies Services area at Maricopa. We believe that if staff enjoy what they are doing and are openly rewarded for their efforts, they will continue to achieve new heights. We also believe that the information technologies area is a very stressful one. Rapid changes in technology and increasing user demands place heavy burdens on staff. Just as it is important to reward efforts, it is also important to provide staff with opportunities for play as a release from this tension.

The playfulness of the Maricopa ITS staff is best epitomized by the departmental mascot—the penguin. The penguin became the ITS mascot several years ago at a time when the staff badly needed a rallying point. We had just completed a serious and risky installation of a major system. The staff had to learn many new skills in a very short period of time. The rallying symbol that helped them move through this stressful period was Opus from the syndicated "Bloom County" cartoon. Opus was a computer buff, and his antics and those of other characters in the story provided the playful outlet the staff needed. The results included penguin tee shirts, a billboard-size penguin poster and, literally, hundreds of penguins occupying bookshelf space in the Information Technologies area. Penguin Hours even began as a time when staff could learn about the latest technologies or technology applications. The first annual Penguin Classic, a districtwide golf tournament for all IT professionals in Maricopa, occurred in the spring of 1991. The penguin has come to represent relief from stress and playfulness—the need to take ourselves less seriously.

Maricopa's use of "rituals" to dramatize our basic cultural values is best illustrated by the All Faculty Convocation, held

[33]Milton Moskowitz, Robert Levering, and Michael Katz, eds., *Everybody's Business. A Field Guide to the 400 Leading Companies in America* (New York: Doubleday, 1990), p. 143-144.

[34]Deal and Kennedy, p. 62.

[35]Belasco, p. 168.

[36]Moskowitz, Levering, and Katz, p. 87.

[37]Robert Levering, *A Great Place to Work. What Makes Some Employers So Good (and Most So Bad)* (New York: Avon Books, 1988), p. 40.

[38]Deal and Kennedy, p. 62.

[39]Peters and Austin, p. 256.

[40]Levering, p. 221.

[41]Moskowitz, Levering, and Katz, p. 144.

at the beginning of each spring semester, and the monthly management breakfasts hosted by the chancellor. One of the basic tenets of Maricopa's organizational culture is that every employee is important. Equally as important is open communication at all levels of the organization. The All Faculty Convocation is a gathering of all full-time faculty within the District. At this all-day meeting, faculty hear the chancellor's latest thinking on the directions of the District, listen to an address by a major national figure, and have an opportunity to meet with their colleagues from throughout the District in instructional-discipline-oriented work sessions. The All Faculty Convocation is also the occasion where Innovator of the Year Awards are announced for each college and for the District as a whole.

Monthly management breakfasts are held with the locations rotated from college to college. Each management breakfast has a major theme focusing on issues of concern to the District. One of the "rituals" that occurs at the first management breakfast each year is that the chancellor asks each attendee to stand and introduce himself/herself to the rest of the group. These are no ordinary introductions. Each year the chancellor thinks of a new theme. In past years we have introduced ourselves by telling: (1) the name of our high school and our high school mascot, (2) what we would do if we could be Chancellor for a Day, (3) the name of our first date, and (4) what we would do if we won the lottery. These first-of-the-year management breakfasts can take two to three hours to complete, but the benefits in camaraderie are felt throughout the year.

There are numerous occasions for "ceremony" in the Information Technologies department and throughout the Maricopa District. Districtwide we have "Outstanding Employee" awards and award banquets, and we participate in the League-for-Innovation-sponsored "Innovator of the Year" awards. Within Information Technologies Services, we have additional awards and ceremonies. First, there is the "Mission Award" which is awarded to individual ITS staff who have displayed an understanding of and commitment to the overall mission of the Maricopa Community Colleges—to support the teaching and learning process within Maricopa. Second, we have individual and team awards that are presented to ITS staff members at regularly scheduled staff meetings. These awards are made at the recommendation of other ITS staff who feel that special achievement has been made.

Finally, we have project-related "ceremonies." Because so many of the projects undertaken by Information Technologies Services require long hours and the cooperation of individuals throughout the District, we have made a conscious effort to celebrate when we complete a project. At the end of the Telecommunications Improvement Project, the unit coordinators from each college received hand-written thank you notes and special project coffee mugs. These mugs bore the Maricopa telecommunications logo and had handles shaped like telephone handsets. Only enough mugs for the individuals who participated in the project were ordered so that only those who worked hard to make the project a success received mugs. At the end of the Video Demonstration Project, we held an "I Survived April" party to thank the faculty and staff who made the project a success. Those attending received a special "I Survived April" tee shirt.

Summary

James Belasco has said that "you can be just as thoughtful, just as meticulous and systematic in developing programs that substantially boost the enthusiasm in your organization, as you are when you test-market your new widget."[42] He's right. It takes very little additional effort to think through the ways in which you can inject fun and celebration into the organization, but the payoff is extremely high. People will work countless hours for a tee shirt or a mug if they believe that the context is meaningful and you are sincere.

This is an important factor. *The fun and celebration must be meaningful and sincere.* Employees know when they are being sincerely rewarded and when they are merely being manipulated. In their book *Dinosaur Brains: Dealing with All Those Impossible People at Work*, Albert Bernstein and Sydney Craft Rozen give the following tips for companies who want to employ the concepts of fun and celebration in their organizations:

1. Before beginning a mad whirl of staff birthday parties and employee-of-the-month celebrations, decide what behaviors or achievements you're going to reward. They should be the kind of behaviors you want to see more of.
2. Once you begin giving noncontingent rewards such as birthday cakes and Christmas cards, these rituals must be continued or people feel insulted. It is best to keep the ritual manageable from the beginning.
3. The office party or company picnic can turn into a ritual of serfdom if the company doesn't take the time to find out what the rituals mean to the people who have to carry them out. Make certain that they are meaningful to everyone.[43]

Research for the "100 Best Companies to Work for in America" revealed that the best places to work were those where the experience of work was fulfilling rather than alienating, where there was a people orientation and a sense of community.[44] Fun and celebration give people the sense of fulfillment and make a little easier the work that we, as information technology professionals, must do.

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[42]Belasco, p. 258.

[43]Albert J. Bernstein and Sydney Craft Rozen, *Dinosaur Brains: Dealing with All Those Impossible People at Work* (New York: Ballantine Books, 1989), p. 233-234.

[44]Levering, p. 221.

VII
Conclusion

In a 1988 issue of *Communications Consultant,* Michael Finneran, president of dBrn Associates Inc., a consulting firm based in Hewlett Neck, NY, presented the "Ten Commandments of Telecommunications." I think it is fitting to end this discussion of the human factors of information technology management with a paraphrased version:

The Ten Commandments of Information Technology

- ✓ *The First Commandment: Remember, this is a business.*
  Our goal as information technology professionals is to provide required services in the most cost-effective way. Technology is the means to achieving this goal, not the goal itself. We cannot let ourselves get so involved with the latest and greatest technology that we forget our real purpose is to support the business of our institutions.
- ✓ *The Second Commandment: Talk to the user.*
  The user is not the enemy. The user is the reason we are here. Our role is to satisfy the users' technology requirements. That means we must understand what their business problems are and be able to explain their technology options in a clear and open manner.
- ✓ *The Third Commandment: Understand your "customer's" business.*
  Information technology systems must "fit in" with the way your customers do business. A good technical decision is not always a good management decision.
- ✓ *The Fourth Commandment: Use the vendor's knowledge.*
  Just as the user is not the enemy, neither is the vendor. Technology companies spend billions of dollars each year to upgrade the technical skills of their employees. Use this knowledge to augment that of your staff so that you make the best possible technology decisions.
- ✓ *The Fifth Commandment: Training is not a discretionary cost.*
  Training is a job that is never finished; it just changes. Providing technical training for information technology staff is crucial. Providing applications training for end users is equally as important. You can never put too much money or effort into the training function.
- ✓ *The Sixth Commandment: Develop IT staff with a mix of business and technical skills.*
  Technical skills are a requirement because we work in a technical environment. Business skills are also required so that we can make good business decisions regarding the acquisition and deployment of technology.
- ✓ *The Seventh Commandment: Management issues are always more important than technology issues.*
  At Maricopa we have the following slogan: "Assets make things possible, people make things happen." Our focus must always remain on the people within the organization. We must look at technology as a way to enhance the skills of these people.
- ✓ *The Eighth Commandment: Make every contact with the user a public relations opportunity.*
  In the fourth section of this paper we discussed the need to avoid misconceptions and communicate clearly with the user. That means making sure that our users know what we can do and that we are committed to doing it well. We are in a constant internal marketing campaign to communicate our goals of service to our user community.
- ✓ *The Ninth Commandment: Spend time on strategy.*
  Information technology professionals must have a "game plan" that will lead the way to the efficient and effective use of technology within the organization. This means understanding the organization's culture and the way in which change is managed within that culture. It means carefully evaluating major technological changes and examining the technical and economic assumptions that support them.
- ✓ *The Tenth Commandment: Have a good time.*
  We work in one of the most exciting and rapidly changing fields of our time. This brings stress to our work environments. It is important to remember that fun and celebration make the work easier and the people in our institutions more fulfilled.

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digital™

Company Profile

Digital Equipment Corporation has enjoyed a close working relationship with the education community for more than 30 years, tracing its roots back to MIT's Digital Computer Laboratory and the historic Whirlwind Project. Digital pioneered the concept of distributed processing, based on the belief that information should be shared and computing made accessible to all users. Throughout its history, the company has promoted computing compatibility and connectivity in organizations.

The Digital style of computing is ideally suited to both the academic and administrative environments of educational institutions. The company's VAX family of computers, from powerful desktop systems to the VAX 9000 mainframe, offers the broadest range of compatible systems in the computer industry. Digital's DECsystem and DECstation family of very high speed RISC (Reduced Instruction Set Computing) systems offers the broadest range of performance in the open systems market. Digital is committed to providing both VMS and ULTRIX (UNIX-based) systems, software, and services.

Headquartered in Maynard, Massachusetts, Digital is the world's leading manufacturer of networked computer systems and services. More than 1.6 million users participate in Digital networks at over 29,000 customer sites. In educational institutions alone, Digital adds more than seven new nodes per day.

Involvement in Higher Education

THE EDUCATION INITIATIVE

A commitment to provide education with the most technologically advanced tools possible has been central to Digital's philosophy since the company was founded. That commitment was re-emphasized with the introduction of The Education Initiative (TEI), a comprehensive set of programs to make both VMS- and UNIX-based computer technology more widely accessible and affordable to education institutions.

A key component of TEI is the Campuswide Software License Grant (CSLG) Program. The CSLG Program provides software licenses at no charge for more than 300 Digital software products, eliminating initial and long-term licensing costs and providing customers increased opportunity to acquire products. The grant includes products that can be used in administrative as well as academic computing, such as full Rdb/VMS, CASE tools, VTX, VAX Notes, ALL-IN-1, and Datatrieve.

More than 1,000 educational institutions have joined the CSLG Program since TEI was introduced. The CSLG Program and other TEI projects have saved campuses millions of dollars in technology expenses and opened new opportunities in computing for administrators, students, faculty, and researchers.

Products and Services

Digital's solutions meet the specific needs of campus computing in every key area—administration, office systems, library automation, instruction, and research.

ALL-IN-1, Digital's office system, is designed to increase personal productivity in all functions across campus. Administrators can communicate with faculty by electronic mail; students can read campus news through videotext; and word processing, time management, calculation, and other functions can be available to any user. ALL-IN-1 also serves as a platform for the many administrative applications offered by Digital's marketing partners—the majority of whom have announced support for VAX Rdb/VMS, Digital's leading relational database software.

Digital's COHESION Environment provides educational institutions with a comprehensive CASE (Computer-Aided Software Engineering) environment and a suite of

tools for the development, deployment, and management of software. COHESION addresses today's need to rapidly produce applications that will run on a variety of platforms, and to create applications with functions that can be distributed across platforms from multiple vendors.

Integration of multi-vendor systems is a major challenge for educational computing today. Digital's Network Application Support (NAS) is a set of software products that enables software applications to integrate effectively with one another and share information across a distributed environment of multi-vendor systems. NAS consists of well-defined programming interfaces, toolkits, and products based on industry standards that help developers build applications that are integrated at a high level and are easily portable from VMS to UNIX, or from one vendor's system to another.

Digital's Integrated Network Computing strategy is a framework for distributing applications in a networked, open-systems environment, providing multiple desktop users with efficient, cost-effective access to the applications they need.

Partnerships

Advances in campus networking and technology have resulted from Digital's many partnerships with educational institutions. World-class advanced research and application development is being performed in top universities worldwide under Digital sponsorship. By forming collaborative relationships with these labs, Digital gains insight into advanced technologies, receives prototypes for future products and services, and recruits top graduate students who have worked on joint projects with Digital.

One case in point is DEC-Athena. An eight-year partnership with the Massachusetts Institute of Technology (MIT) and IBM, focusing on MIT's Project Athena, has spawned DEC-Athena. Based on Project Athena, DEC-Athena is an array of software and services that provides an efficient, cost-effective way to manage large numbers of workstations in a network.

Through partnerships with leading vendors, Digital offers more administrative solutions on its platforms than any other company.

Since joining the association in 1981, Digital has participated in the CAUSE national conference annually through presentations, sponsorships, and exhibits. CAUSE uses a VAX-based administrative computing system, including ALL-IN-1.

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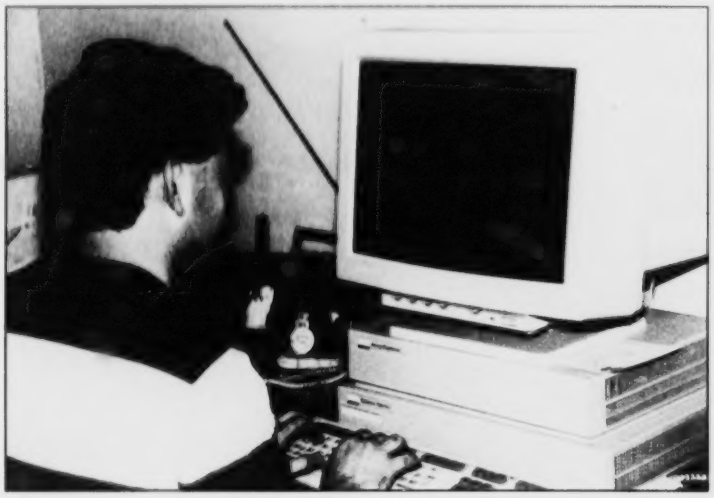

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